WT Docket No. 02-8

EX PARTE OR LATE FILED

LAND MOBILE COMMUNICATIONS COUNCIL

Writer's Address and Telephone Number:

1110 N. Glebe Rd.
Suite 500
Arlington, VA 22201
(703) 528-5115

MEMBERS

AAA
AAR
AASHTO
AMTA
APCO
API
ARINC
ATA
CSAA
FCCA
FIT
IAFC
IAFWA
IMSA
ITA
ITLA
ITSA
MRFAC
NASF
PCIA
TIA
UTC

ORIGINAL

RECEIVED

MAY 1 4 2003

Federal Communications Commission
Office of the Secretary

February 4, 2003

John Muleta, Esq.
Chief, Wireless Telecommunications Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington D.C. 20554

Re: Frequency Coordination Procedures for Telemetry Use in the 1427-1432 MHz Band

Dear Mr. Muleta:

On September 16, 2002 the Land Mobile Communications Council (LMCC) advised the Chief, Wireless Telecommunications Bureau that the FCC's certified Part 90 Frequency Advisory Committees (FACs), as represented by LMCC, had agreed on procedures for coordinating primary and secondary telemetry use in the 1427-1432 MHz band. The FACs were authorized to coordinate the designated spectrum as part of the Report and Order in WT Docket No. 02-08. That R&O adopted service rules for 27 MHz of spectrum reallocated for non-government use.

Since September, LMCC has engaged in discussions with the Public Safety and Private Wireless Division and we have modified the procedures as a result of the those discussions. The only major change is in regards to the channelization plan. The frequencies have been shifted downward by 6.25 kHz from the original plan in order to accommodate 50 kHz aggregation. There are also some minor language changes that can be found at the beginning of Appendix A, clarifying shared use issues.

No. of Copies rec'd 0
List A B C D E

A copy of the revised procedures is enclosed for your information. Please feel free to contact us if you have any questions.

Sincerely,

Larry A. Miller
President

cc: Office of the Secretary
D'wana Terry
Mary Shultz
Tracy Simmons

Contents

Background

The FCC has allocated frequencies in the 1427-1432 MHz band for private telemetry use. The frequencies are governed by FCC Rule Part 90, specifically, Rule 90.259 in this case. This document defines guidelines for the coordination and assignment of frequencies in this band. The procedures incorporate FCC mandates on the band as detailed in Docket FCC-02-152A1, which defined the service rules for this band, among others.

Frequencies and Eligibility

Frequencies in the 1427-1432 MHz band may be assigned to applicants who establish eligibility in the Public Safety Pool or the Industrial/Business Pool. Assignable frequencies occur in increments of 12.5 kHz from 1427.00625 MHz to 1431.9875 MHz. Bandwidths of 12.5 kHz to 50.0 kHz are available, with higher bandwidths available upon a showing of need. Frequencies spaced at 12.5 kHz are also used to allow bandwidth greater than 12.5 kHz per the channelization table attached to this document. A diagram showing the channel structure is provided below.

Frequencies are available with three maximum effective radiate power (EIRP) levels: one watt, ten watts and one hundred watts. ULS will use ERPd values of 0.61 watts, 6.1 watts and 61.1 watts

The 1427-1432 MHz band is shared with the wireless medical telemetry service (WMTS). All Part 90 telemetry operations in the 1427-1429.5 MHz band are **secondary** to the WMTS except in the locations specified in Appendix B (Swap Areas). In the swap areas, all operations are **secondary** to the WMTS in the 1429-1431.5 MHz band.

All telemetry operations in the 1429.5-1432 MHz band are **primary** in status except in the swap areas. In the swap areas, all telemetry operations are **primary** in status in the 1427-1429 MHz and 1431.5-1432 MHz bands.

Area of Operation, Modes and Permissible Traffic

Use of this band is limited to telemetering purposes. No voice communications are allowed. Permitted station types include base, mobile, operational fixed and temporary fixed stations. Base stations authorized in these bands shall be used to perform telecommand functions with associated fixed and mobile telemetering stations. Base stations may also command actions by the vehicle itself, but will not be authorized solely to perform this function. Temporary fixed stations may remain at their locations indefinitely. These stations will be defined by geographic coordinates and service radius.

Wide area operations will not be authorized. The area of normal day-to-day operations will be described on the application in terms of maximum distance from a geographical center (latitude and longitude).

Maximum ERPs

Primary channels at 1429.5-1432.0 MHz in non-swap areas:

Operation	**Frequency range (MHz)**			
	1429.5-1430	**1430-1430.5**	**1430.5-1431.5**	**1431.5-1432**
Fixed	0.61 watt	0.61 watt	6.1 watts	61.1 watts
Mobile	15 milliwatts	.61 watt	0.61 watt	0.61 watt
Temporary fixed	0.61 watt	0.61 watt	0.61 watt	0.61 watt

Primary channels at 1427.0-1429.0 and 1431.5-1432.0 MHz in swap areas:

Operation	**Frequency range (MHz)**			
	1427-1428 MHz	**1428-1428.5**	**1428.5-1429**	**1431.5-1432**
Fixed	61.1 watts	6.1 watts	0.61 watt	0.61 watt
Mobile	0.61 watt	0.61 watt	15 milliwatts	15 milliwatts
Temp, Fixed	0.61 watt	0.61 watt	0.61 watt	0.61 watt

Application Format

Form 601 and ULS will be used. Area of operation will be defined by latitude longitude and radius in kilometers. Fixed base stations will be allowed. Mobile stations will be

allowed. Temporary fixed operation are allowed - applicants will be required to specify these "temporary fixed" operations in terms of a maximum distance from a geographical center. These "temporary fixed" locations may be operated indefinitely without requiring separate authorization. Directional antennas may be employed at high power base stations.

Frequency Coordination Requirements

Frequencies are subject to coordination. All Part 90 coordinators may provide coordination services. Except for administrative changes, applications for new or modified systems will be filed through FCC Certified Coordinating Committees, in accordance with Part 90 procedures. Interagency notification requirements between frequency coordinators will follow currently accepted LMCC procedures for notifying other coordinators of applications to be filed with the Commission.

The channels are adjacent to Wireless Medical Telemetry Service (WMTS). Notification is required to WMTS coordinator, American Hospital Association/American Society of Health Care Engineers (AHA/ASHE) within 24 hours of filing an application with the FCC. AHA/ASHE will send notifications to Private Land Mobile Radio Service (PLMRS) coordinators of new WMTS installations. ***This point is under reconsideration at the FCC.***

Equipment must protect co-channel WMTS frequencies, in accordance with Rule 90.259(b)(11),in those areas where WMTS is primary. Rule 90.259(b)(11) limits the field strength that non-WMTS telemetry devices in the 1427-1432 MHz band may radiate – into the WMTS portions of the band[1] – to a measured or predicted field strength of 150 uV/m at the site of any WMTS operation.[2] By filing applications in this band, applicants certify that they meet these requirements.

Frequency assignment methodologies are provided in Appendix A. Coordinators will adhere to these guidelines and cooperate with one another should conflicts arise.

Summary

These procedures are agreed to by the members of LMCC and are provided to the FCC for information purposes.

[1] WMTS operates in the 1427-1429.5 MHz band except in the seven geographic "carve-out" areas where WMTS operates in the 1429-1431.5 MHz band.

[2] This limit on the field strength radiated by a telemetry operation will apply at the location of any healthcare facility employing WMTS equipment in the 1427-1432 MHz band. Healthcare facilities are defined in 47 C.F.R § 95.1103(b).

Appendix A: Frequency Assignments for 1427-1432 MHz Telemetry Channels

The following list will serve as recommendations for assigning channels in the 1427-1432 MHz telemetry band.

Shared Use

1. Frequencies are shared, but, to avoid potential interference, every effort should be made to assign unique frequencies to different applicants in a given geographic area, as long as the overall goal of maximizing efficient use of the available frequencies can be accomplished.

2. There is no FCC-mandated distance separation between co-channel systems. 113 km (70 miles) co-channel separation is recommended between locations defined by longitude and latitude. This includes base stations, operational fixed stations, temporary fixed, and mobile location in the FCC records.

3. In the event that co-channel systems are requested at less than 113 km separation, due consideration should be provided to incumbent systems, up to and including engineering showings that incumbent systems will not be adversely impacted.

4. Systems designed for operation with 10,000 or more telemetry units in a geographic area should be considered not compatible for sharing or short spacing and alternative channels should be selected.

5. In order to ensure that the area of operation for **temporary fixed stations and mobiles** do not overlap that of existing applicants or licensees, this area should not exceed 56.5 km (35 miles), which is half the recommended fixed station separation. Fixed stations will be licensed on a site-by-site basis.

Channel Assignments

6. Minimum bandwidth is 12.5 kHz; maximum bandwidth is 50 kHz without showing of justification.

7. Channel should be assigned based on distance separation and requested Effective Radiated Power (ERP).

8. Channels are designated as having a maximum assignable bandwidth of 12.5 kHz, 25 kHz and 50 kHz. For coordination purposes, frequency assignment should not be made that result in bandwidth overlap.

9. Never assign co-channel primary WMTS (secondary telemetry) channels without coordination and approval of AHA/ASHE.

10. If no channels are available at the requested ERP, channels available for higher ERPs should be assigned. For example, if an applicant requests a 1 watt designated channel and none is available; the coordinator should look at 10 watt channels.

Appendix B: Swap Areas

For the following areas, frequencies are "swapped" with WMTS. Primary channels are 1427-1429 MHz and 1431.5-1432.0 MHz (see channel spreadsheet). The areas are:

1. **Pittsburgh, Pennsylvania market** (Westmoreland, Washington, Beaver, Allegheny, and Butler counties)

2. **Northern Virginia and Washington, DC market** (Arlington, Loudon, Prince William, Fairfax, Fauquier counties, VA; Alexandria, Fairfax, Falls Church cities, VA; Montgomery, Prince George's, and Charles counties, MD; and District of Columbia)

3. **Richmond and Norfolk, Virginia market** (Chesterfield, Dinwiddie, Goochland, Powhatan, Hanover, Henrico and Prince George counties; Charles City, Colonial Heights, Hopewell, Petersburg, Richmond, Isle of Wight and York counties; James City, Norfolk, Newport News, Hampton, Poquoson, Virginia Beach, Chesapeake, Portsmouth, Suffolk, Williamsburg, New Kent, Surry, Sussex, Southampton counties and Franklin cities)Why three parenthetical sections?

4. **Austin and Georgetown, Texas market** (Williamson and Travis counties)

5. **Battle Creek, Michigan market** (Calhoun county)

6. **Detroit, Michigan market** (Oakland, Macomb, Washtenaw, Wayne and Livingston counties)

7. **Spokane, Washington market** (Spokane county, WA and Kootenai county, ID)

Maximum ERP in swap areas:

At the locations specified above, primary operations are performed in the 1427-1429 MHz and 1431.5-1432 MHz bands. The maximum EIRP (ERP?) limitations are as follows:

Operation	Frequency range (MHz)			
	1427-1428 MHz	1428-1428.5	1428.5-1429	1431.5-1432
Fixed	61.1 watts	6.1 watts	0.61 watt	0.61 watt
Mobile	0.61 watt	0.61 watt	15 milliwatts	15 milliwatts
Temp, Fixed	0.61 watt	0.61 watt	0.61 watt	0.61 watt

Appendix C: New Rule 90.259

§ 90.259 Assignment and use of frequencies in the bands 216-220 MHz and 1427-1432 MHz.

(a) 216-220 MHz band.

(1) Frequencies in the 216-220 MHz band may be assigned to applicants that establish eligibility in the Industrial/Business Pool.

(2) All operation is secondary to the fixed and mobile services, including the Low Power Radio Service.

(3) In the 216-217 MHz band, no new assignments will be made after January 1, 2002.

(4) In the 217-220 MHz band, the maximum transmitter output power is 2 watts. The maximum antenna height above average terrain (HAAT) is 152 m (500 feet).

(5) In the 217-220 MHz band, base, mobile, and operational fixed is permitted.

(6) Wide area operations will not be authorized. The area of normal day-to-day operations will be described in the application in terms of maximum distance from a geographical center (latitude and longitude).

(7) Assignable frequencies occur in increments of 6.25 kHz from 217.0625 MHz to 219.99375 MHz.

(8) Licensees may combine contiguous channels up to 50 kHz, and more than 50 kHz only upon a showing of adequate justification.

(b) 1427-1432 MHz band.

(1) Frequencies in the 1427-1432 MHz band may be assigned to applicants that establish eligibility in the Public Safety Pool or the Industrial/Business Pool.

(2) All operations in the 1427-1429.5 MHz band are secondary to the Wireless Medical Telemetry Service except in the locations specified in paragraph (b)(4) of this section. At the locations specified in paragraph (b)(4) of this section, all operations are secondary to the Wireless Medical Telemetry Service in the 1429-1431.5 MHz band.

(3) All operations in the 1429.5-1432 MHz band are primary in status except in the locations specified in paragraph (b)(4) of this section. At the locations specified in paragraph (b)(4) of this section, all operations are primary in status in the 1427-1429 MHz and 1431.5-1432 MHz bands.

(4) Locations:

(i) Pittsburgh, Pennsylvania – Counties of Westmoreland, Washington, Beaver, Allegheny and Butler;

(ii) Washington, DC metropolitan area – Counties of Montgomery, Prince George's, Charles, Arlington, Prince William, Fauquier, Loudon, and Fairfax; Cities of Alexandria, Falls Church, Fairfax, and District of Columbia;

(iii) Richmond/Norfolk, Virginia – Counties of Charles City, Chesterfield, Dinwiddie, Goochland, Hanover, Henrico, Isle of Wight, James City, New Kent, Powhatan, Prince George, Southhampton, Surrey, Sussex, and York; Cities of Chesapeake, Colonial Heights, Franklin, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach, and Williamsburg;

(iv) Austin/Georgetown, Texas – Counties of Williamson and Travis;

(v) Battle Creek, Michigan – County of Calhoun;

(vi) Detroit, Michigan – Counties of Oakland, Wayne, Washtenaw, Macomb and Livingston;

(vii) Spokane, Washington – Counties of Spokane, WA and Kootenai, ID.

(5) All operations in the 1429.5-1432 MHz band authorized prior to April 12, 2002 are on a secondary basis.

(6) For secondary operations only fixed stations are permitted. At the locations specified in (b)(4) of this section, secondary operations are performed in the 1429-1431.5 MHz band. For all other locations, secondary operations are performed in the 1427-1429.5 MHz band. The maximum power is 1 watt EIRP.

(7) For primary operations base, mobile, operational fixed and temporary fixed operations are permitted.

(i) At the locations specified in (b)(4) of this section, primary operations are performed in the 1427-1429 MHz and 1431.5-1432 MHz bands. The maximum EIRP limitations are as follows:

Operation	Frequency range (MHz)			
	1427-1428 MHz	1428-1428.5	1428.5-1429	1431.5-1432
Fixed	100 watts	10 watts	1 watt	1 watt

Mobile	1 watt	1 watt	25 milliwatts	25 milliwatts
Temporary fixed	1 watt	1 watt	1 watt	1 watt

(ii) For all other locations, primary operations are performed in the 1429.5-1432 MHz band. The maximum EIRP limitations are as follows:

Operation	Frequency range (MHz)			
	1429.5-1430	1430-1430.5	1430.5-1431.5	1431.5-1432
Fixed	1 watt	1 watt	10 watts	100 watts
Mobile	25 milliwatts	1 watt	1 watt	1 watt
Temporary fixed	1 watt	1 watt	1 watt	1 watt

(8) Wide area operations will not be authorized. The area of normal day-to-day operations will be described in the application in terms of maximum distance from a geographical center (latitude and longitude).

(9) Assignable frequencies occur in increments of 12.5 kHz from 1427.0125 MHz to 1431.9875 MHz.

(10) Licensees, however, may combine contiguous channels up to 50 kHz, and more than 50 kHz only upon a showing of adequate justification.

(11) For any operation in the 1427-1432 MHz band, the predicted or measured field strength – in the WMTS primary band – at the location of any registered WMTS healthcare facility shall not exceed 150 uV/m. For the locations specified in (b)(4) of this section, WMTS is primary in the 1429-1431.5 MHz band. For all other locations, WMTS is primary in the 1427-1429.5 MHz band.

(c) Authorized uses.

(1) Use of these bands is limited to telemetering purposes.

(2) Base stations authorized in these bands shall be used to perform telecommand functions with associated mobile telemetering stations. Base stations may also command actions by the vehicle itself, but will not be authorized solely to perform this function.

(3) Airborne use is prohibited.

Appendix D. Primary Channels in Non-Swap Areas

1.4 GHz Telemetry Proposed Channelization
Primary Channels in Non-Swap Areas

Channel #	Frequency 12.5 kHz	Frequency Channel #	Frequency 25 kHz	Frequency Channel #	Frequency 50 kHz	MAX ERP Watts
1	1429.50625					0.6
		201	1429.51250			0.6
2	1429.51875					0.6
				301	1429.52500	0.6
3	1429.53125					0.6
		202	1429.53750			0.6
4	1429.54375					0.6
5	1429.55625					0.6
		203	1429.56250			0.6
6	1429.56875					0.6
				302	1429.57500	0.6
7	1429.58125					0.6
		204	1429.58750			0.6
8	1429.59375					0.6
9	1429.60625					0.6
		205	1429.61250			0.6
10	1429.61875					0.6
				303	1429.62500	0.6
11	1429.63125					0.6
		206	1429.63750			0.6
12	1429.64375					0.6
13	1429.65625					0.6
		207	1429.66250			0.6
14	1429.66875					0.6
				304	1429.67500	0.6
15	1429.68125					0.6
		208	1429.68750			0.6
16	1429.69375					0.6
17	1429.70625					0.6
		209	1429.71250			0.6
18	1429.71875					0.6
				305	1429.72500	0.6
19	1429.73125					0.6
		210	1429.73750			0.6
20	1429.74375					0.6

21	1429.75625					0.6
		211	1429.76250			0.6
22	1429.76875					0.6
				306	1429.77500	0.6
23	1429.78125					0.6
		212	1429.78750			0.6
24	1429.79375					0.6
25	1429.80625					0.6
		213	1429.81250			0.6
26	1429.81875					0.6
				307	1429.82500	0.6
27	1429.83125					0.6
		214	1429.83750			0.6
28	1429.84375					0.6
29	1429.85625					0.6
		215	1429.86250			0.6
30	1429.86875					0.6
				308	1429.87500	0.6
31	1429.88125					0.6
		216	1429.88750			0.6
32	1429.89375					0.6
33	1429.90625					0.6
		217	1429.91250			0.6
34	1429.91875					0.6
				309	1429.92500	0.6
35	1429.93125					0.6
		218	1429.93750			0.6
36	1429.94375					0.6
37	1429.95625					0.6
		219	1429.96250			0.6
38	1429.96875					0.6
				310	1429.97500	0.6
39	1429.98125					0.6
		220	1429.98750			0.6
40	1429.99375					0.6
41	1430.00625					0.6
		221	1430.01250			0.6
42	1430.01875					0.6
				311	1430.02500	0.6
43	1430.03125					0.6
		222	1430.03750			0.6
44	1430.04375					0.6

45	1430.05625					0.6
		223	1430.06250			0.6
46	1430.06875					0.6
				312	1430.07500	0.6
47	1430.08125					0.6
		224	1430.08750			0.6
48	1430.09375					0.6
49	1430.10625					0.6
		225	1430.11250			0.6
50	1430.11875					0.6
				313	1430.12500	0.6
51	1430.13125					0.6
		226	1430.13750			0.6
52	1430.14375					0.6
53	1430.15625					0.6
		227	1430.16250			0.6
54	1430.16875					0.6
				314	1430.17500	0.6
55	1430.18125					0.6
		228	1430.18750			0.6
56	1430.19375					0.6
57	1430.20625					0.6
		229	1430.21250			0.6
58	1430.21875					0.6
				315	1430.22500	0.6
59	1430.23125					0.6
		230	1430.23750			0.6
60	1430.24375					0.6
61	1430.25625					0.6
		231	1430.26250			0.6
62	1430.26875					0.6
				316	1430.27500	0.6
63	1430.28125					0.6
		232	1430.28750			0.6
64	1430.29375					0.6
65	1430.30625					0.6
		233	1430.31250			0.6
66	1430.31875					0.6
				317	1430.32500	0.6
67	1430.33125					0.6
		234	1430.33750			0.6
68	1430.34375					0.6

69	1430.35625					0.6
		235	1430.36250			0.6
70	1430.36875					0.6
				318	1430.37500	0.6
71	1430.38125					0.6
		236	1430.38750			0.6
72	1430.39375					0.6
73	1430.40625					0.6
		237	1430.41250			0.6
74	1430.41875					0.6
				319	1430.42500	0.6
75	1430.43125					0.6
		238	1430.43750			0.6
76	1430.44375					0.6
77	1430.45625					0.6
		239	1430.46250			0.6
78	1430.46875					0.6
				320	1430.47500	0.6
79	1430.48125					0.6
		240	1430.48750			0.6
80	1430.49375					0.6
81	1430.50625					6.1
		241	1430.51250			6.1
82	1430.51875					6.1
				321	1430.52500	6.1
83	1430.53125					6.1
		242	1430.53750			6.1
84	1430.54375					6.1
85	1430.55625					6.1
		243	1430.56250			6.1
86	1430.56875					6.1
				322	1430.57500	6.1
87	1430.58125					6.1
		244	1430.58750			6.1
88	1430.59375					6.1
89	1430.60625					6.1
		245	1430.61250			6.1
90	1430.61875					6.1
				323	1430.62500	6.1
91	1430.63125					6.1
		246	1430.63750			6.1
92	1430.64375					6.1

93	1430.65625					6.1
		247	1430.66250			6.1
94	1430.66875					6.1
				324	1430.67500	6.1
95	1430.68125					6.1
		248	1430.68750			6.1
96	1430.69375					6.1
97	1430.70625					6.1
		249	1430.71250			6.1
98	1430.71875					6.1
				325	1430.72500	6.1
99	1430.73125					6.1
		250	1430.73750			6.1
100	1430.74375					6.1
101	1430.75625					6.1
		251	1430.76250			6.1
102	1430.76875					6.1
				326	1430.77500	6.1
103	1430.78125					6.1
		252	1430.78750			6.1
104	1430.79375					6.1
105	1430.80625					6.1
		253	1430.81250			6.1
106	1430.81875					6.1
				327	1430.82500	6.1
107	1430.83125					6.1
		254	1430.83750			6.1
108	1430.84375					6.1
109	1430.85625					6.1
		255	1430.86250			6.1
110	1430.86875					6.1
				328	1430.87500	6.1
111	1430.88125					6.1
		256	1430.88750			6.1
112	1430.89375					6.1
113	1430.90625					6.1
		257	1430.91250			6.1
114	1430.91875					6.1
				329	1430.92500	6.1
115	1430.93125					6.1
		258	1430.93750			6.1
116	1430.94375					6.1

117	1430.95625					6.1
		259	1430.96250			6.1
118	1430.96875					6.1
				330	1430.97500	6.1
119	1430.98125					6.1
		260	1430.98750			6.1
120	1430.99375					6.1
121	1431.00625					6.1
		261	1431.01250			6.1
122	1431.01875					6.1
				331	1431.02500	6.1
123	1431.03125					6.1
		262	1431.03750			6.1
124	1431.04375					6.1
125	1431.05625					6.1
		263	1431.06250			6.1
126	1431.06875					6.1
				332	1431.07500	6.1
127	1431.08125					6.1
		264	1431.08750			6.1
128	1431.09375					6.1
129	1431.10625					6.1
		265	1431.11250			6.1
130	1431.11875					6.1
				333	1431.12500	6.1
131	1431.13125					6.1
		266	1431.13750			6.1
132	1431.14375					6.1
133	1431.15625					6.1
		267	1431.16250			6.1
134	1431.16875					6.1
				334	1431.17500	6.1
135	1431.18125					6.1
		268	1431.18750			6.1
136	1431.19375					6.1
137	1431.20625					6.1
		269	1431.21250			6.1
138	1431.21875					6.1
				335	1431.22500	6.1
139	1431.23125					6.1
		270	1431.23750			6.1
140	1431.24375					6.1

141	1431.25625					6.1
		271	1431.26250			6.1
142	1431.26875					6.1
				336	1431.27500	6.1
143	1431.28125					6.1
		272	1431.28750			6.1
144	1431.29375					6.1
145	1431.30625					6.1
		273	1431.31250			6.1
146	1431.31875					6.1
				337	1431.32500	6.1
147	1431.33125					6.1
		274	1431.33750			6.1
148	1431.34375					6.1
149	1431.35625					6.1
		275	1431.36250			6.1
150	1431.36875					6.1
				338	1431.37500	6.1
151	1431.38125					6.1
		276	1431.38750			6.1
152	1431.39375					6.1
153	1431.40625					6.1
		277	1431.41250			6.1
154	1431.41875					6.1
				339	1431.42500	6.1
155	1431.43125					6.1
		278	1431.43750			6.1
156	1431.44375					6.1
157	1431.45625					6.1
		279	1431.46250			6.1
158	1431.46875					6.1
				340	1431.47500	6.1
159	1431.48125					6.1
		280	1431.48750			6.1
160	1431.49375					6.1
161	1431.50625					61.1
		281	1431.51250			61.1
162	1431.51875					61.1
				341	1431.52500	61.1
163	1431.53125					61.1
		282	1431.53750			61.1
164	1431.54375					61.1

165	1431.55625					61.1
		283	1431.56250			61.1
166	1431.56875					61.1
				342	1431.57500	61.1
167	1431.58125					61.1
		284	1431.58750			61.1
168	1431.59375					61.1
169	1431.60625					61.1
		285	1431.61250			61.1
170	1431.61875					61.1
				343	1431.62500	61.1
171	1431.63125					61.1
		286	1431.63750			61.1
172	1431.64375					61.1
173	1431.65625					61.1
		287	1431.66250			61.1
174	1431.66875					61.1
				344	1431.67500	61.1
175	1431.68125					61.1
		288	1431.68750			61.1
176	1431.69375					61.1
177	1431.70625					61.1
		289	1431.71250			61.1
178	1431.71875					61.1
				345	1431.72500	61.1
179	1431.73125					61.1
		290	1431.73750			61.1
180	1431.74375					61.1
181	1431.75625					61.1
		291	1431.76250			61.1
182	1431.76875					61.1
				346	1431.77500	61.1
183	1431.78125					61.1
		292	1431.78750			61.1
184	1431.79375					61.1
185	1431.80625					61.1
		293	1431.81250			61.1
186	1431.81875					61.1
				347	1431.82500	61.1
187	1431.83125					61.1
		294	1431.83750			61.1
188	1431.84375					61.1

189	1431.85625					61.1
		295	1431.86250			61.1
190	1431.86875					61.1
				348	1431.87500	61.1
191	1431.88125					61.1
		296	1431.88750			61.1
192	1431.89375					61.1
193	1431.90625					61.1
		297	1431.91250			61.1
194	1431.91875					61.1
				349	1431.92500	61.1
195	1431.93125					61.1
		298	1431.93750			61.1
196	1431.94375					61.1
197	1431.95625					61.1
		299	1431.96250			61.1
198	1431.96875					61.1
				350	1431.97500	61.1
199	1431.98125					61.1
		300	1431.98750			61.1
200	1431.99375					61.1

Appendix E. Primary Channels in Swap Areas

1.4 GHz Telemetry Proposed Channelization

Primary Channels in Swap Areas

Channel #	Frequency 12.5 kHz	Channel #	Frequency 25 kHz	Channel #	Frequency 50 kHz	MAX ERP Watts
401	1427.00625					61.1
		601	1427.01250			61.1
402	1427.01875					61.1
				701	1427.02500	61.1
403	1427.03125					61.1
		602	1427.03750			61.1
404	1427.04375					61.1
405	1427.05625					61.1
		603	1427.06250			61.1
406	1427.06875					61.1
				702	1427.07500	61.1
407	1427.08125					61.1
		604	1427.08750			61.1
408	1427.09375					61.1
409	1427.10625					61.1
		605	1427.11250			61.1
410	1427.11875					61.1
				703	1427.12500	61.1
411	1427.13125					61.1
		606	1427.13750			61.1
412	1427.14375					61.1
413	1427.15625					61.1
		607	1427.16250			61.1
414	1427.16875					61.1
				704	1427.17500	61.1
415	1427.18125					61.1
		608	1427.18750			61.1
416	1427.19375					61.1
417	1427.20625					61.1
		609	1427.21250			61.1
418	1427.21875					61.1
				705	1427.22500	61.1
419	1427.23125					61.1
		610	1427.23750			61.1
420	1427.24375					61.1

421	1427.25625					61.1
		611	1427.26250			61.1
422	1427.26875					61.1
				706	1427.27500	61.1
423	1427.28125					61.1
		612	1427.28750			61.1
424	1427.29375					61.1
425	1427.30625					61.1
		613	1427.31250			61.1
426	1427.31875					61.1
				707	1427.32500	61.1
427	1427.33125					61.1
		614	1427.33750			61.1
428	1427.34375					61.1
429	1427.35625					61.1
		615	1427.36250			61.1
430	1427.36875					61.1
				708	1427.37500	61.1
431	1427.38125					61.1
		616	1427.38750			61.1
432	1427.39375					61.1
433	1427.40625					61.1
		617	1427.41250			61.1
434	1427.41875					61.1
				709	1427.42500	61.1
435	1427.43125					61.1
		618	1427.43750			61.1
436	1427.44375					61.1
437	1427.45625					61.1
		619	1427.46250			61.1
438	1427.46875					61.1
				710	1427.47500	61.1
439	1427.48125					61.1
		620	1427.48750			61.1
440	1427.49375					61.1
441	1427.50625					61.1
		621	1427.51250			61.1
442	1427.51875					61.1
				711	1427.52500	61.1
443	1427.53125					61.1
		622	1427.53750			61.1
444	1427.54375					61.1

445	1427.55625					61.1
		623	1427.56250			61.1
446	1427.56875					61.1
				712	1427.57500	61.1
447	1427.58125					61.1
		624	1427.58750			61.1
448	1427.59375					61.1
449	1427.60625					61.1
		625	1427.61250			61.1
450	1427.61875					61.1
				713	1427.62500	61.1
451	1427.63125					61.1
		626	1427.63750			61.1
452	1427.64375					61.1
453	1427.65625					61.1
		627	1427.66250			61.1
454	1427.66875					61.1
				714	1427.67500	61.1
455	1427.68125					61.1
		628	1427.68750			61.1
456	1427.69375					61.1
457	1427.70625					61.1
		629	1427.71250			61.1
458	1427.71875					61.1
				715	1427.72500	61.1
459	1427.73125					61.1
		630	1427.73750			61.1
460	1427.74375					61.1
461	1427.75625					61.1
		631	1427.76250			61.1
462	1427.76875					61.1
				716	1427.77500	61.1
463	1427.78125					61.1
		632	1427.78750			61.1
464	1427.79375					61.1
465	1427.80625					61.1
		633	1427.81250			61.1
466	1427.81875					61.1
				717	1427.82500	61.1
467	1427.83125					61.1
		634	1427.83750			61.1
468	1427.84375					61.1

469	1427.85625					61.1
		635	1427.86250			61.1
470	1427.86875					61.1
				718	1427.87500	61.1
471	1427.88125					61.1
		636	1427.88750			61.1
472	1427.89375					61.1
473	1427.90625					61.1
		637	1427.91250			61.1
474	1427.91875					61.1
				719	1427.92500	61.1
475	1427.93125					61.1
		638	1427.93750			61.1
476	1427.94375					61.1
477	1427.95625					61.1
		639	1427.96250			61.1
478	1427.96875					61.1
				720	1427.97500	61.1
479	1427.98125					61.1
		640	1427.98750			61.1
480	1427.99375					61.1
481	1428.00625					6.1
		641	1428.01250			6.1
482	1428.01875					6.1
				721	1428.02500	6.1
483	1428.03125					6.1
		642	1428.03750			6.1
484	1428.04375					6.1
485	1428.05625					6.1
		643	1428.06250			6.1
486	1428.06875					6.1
				722	1428.07500	6.1
487	1428.08125					6.1
		644	1428.08750			6.1
488	1428.09375					6.1
489	1428.10625					6.1
		645	1428.11250			6.1
490	1428.11875					6.1
				723	1428.12500	6.1
491	1428.13125					6.1
		646	1428.13750			6.1
492	1428.14375					6.1

493	1428.15625					6.1
		647	1428.16250			6.1
494	1428.16875					6.1
				724	1428.17500	6.1
495	1428.18125					6.1
		648	1428.18750			6.1
496	1428.19375					6.1
497	1428.20625					6.1
		649	1428.21250			6.1
498	1428.21875					6.1
				725	1428.22500	6.1
499	1428.23125					6.1
		650	1428.23750			6.1
500	1428.24375					6.1
501	1428.25625					6.1
		651	1428.26250			6.1
502	1428.26875					6.1
				726	1428.27500	6.1
503	1428.28125					6.1
		652	1428.28750			6.1
504	1428.29375					6.1
505	1428.30625					6.1
		653	1428.31250			6.1
506	1428.31875					6.1
				727	1428.32500	6.1
507	1428.33125					6.1
		654	1428.33750			6.1
508	1428.34375					6.1
509	1428.35625					6.1
		655	1428.36250			6.1
510	1428.36875					6.1
				728	1428.37500	6.1
511	1428.38125					6.1
		656	1428.38750			6.1
512	1428.39375					6.1
513	1428.40625					6.1
		657	1428.41250			6.1
514	1428.41875					6.1
				729	1428.42500	6.1
515	1428.43125					6.1
		658	1428.43750			6.1
516	1428.44375					6.1

517	1428.45625					6.1
		659	1428.46250			6.1
518	1428.46875					6.1
				730	1428.47500	6.1
519	1428.48125					6.1
		660	1428.48750			6.1
520	1428.49375					6.1
521	1428.50625					0.6
		661	1428.51250			0.6
522	1428.51875					0.6
				731	1428.52500	0.6
523	1428.53125					0.6
		662	1428.53750			0.6
524	1428.54375					0.6
525	1428.55625					0.6
		663	1428.56250			0.6
526	1428.56875					0.6
				732	1428.57500	0.6
527	1428.58125					0.6
		664	1428.58750			0.6
528	1428.59375					0.6
529	1428.60625					0.6
		665	1428.61250			0.6
530	1428.61875					0.6
				733	1428.62500	0.6
531	1428.63125					0.6
		666	1428.63750			0.6
532	1428.64375					0.6
533	1428.65625					0.6
		667	1428.66250			0.6
534	1428.66875					0.6
				734	1428.67500	0.6
535	1428.68125					0.6
		668	1428.68750			0.6
536	1428.69375					0.6
537	1428.70625					0.6
		669	1428.71250			0.6
538	1428.71875					0.6
				735	1428.72500	0.6
539	1428.73125					0.6
		670	1428.73750			0.6
540	1428.74375					0.6

541	1428.75625					0.6
		671	1428.76250			0.6
542	1428.76875					0.6
				736	1428.77500	0.6
543	1428.78125					0.6
		672	1428.78750			0.6
544	1428.79375					0.6
545	1428.80625					0.6
		673	1428.81250			0.6
546	1428.81875					0.6
				737	1428.82500	0.6
547	1428.83125					0.6
		674	1428.83750			0.6
548	1428.84375					0.6
549	1428.85625					0.6
		675	1428.86250			0.6
550	1428.86875					0.6
				738	1428.87500	0.6
551	1428.88125					0.6
		676	1428.88750			0.6
552	1428.89375					0.6
553	1428.90625					0.6
		677	1428.91250			0.6
554	1428.91875					0.6
				739	1428.92500	0.6
555	1428.93125					0.6
		678	1428.93750			0.6
556	1428.94375					0.6
557	1428.95625					0.6
		679	1428.96250			0.6
558	1428.96875					0.6
				740	1428.97500	0.6
559	1428.98125					0.6
		680	1428.98750			0.6
560	1428.99375					0.6
561	1431.50625					0.6
		681	1431.51250			0.6
562	1431.51875					0.6
				741	1431.52500	0.6
563	1431.53125					0.6
		682	1431.53750			0.6
564	1431.54375					0.6

565	1431.55625					0.6
		683	1431.56250			0.6
566	1431.56875					0.6
				742	1431.57500	0.6
567	1431.58125					0.6
		684	1431.58750			0.6
568	1431.59375					0.6
569	1431.60625					0.6
		685	1431.61250			0.6
570	1431.61875					0.6
				743	1431.62500	0.6
571	1431.63125					0.6
		686	1431.63750			0.6
572	1431.64375					0.6
573	1431.65625					0.6
		687	1431.66250			0.6
574	1431.66875					0.6
				744	1431.67500	0.6
575	1431.68125					0.6
		688	1431.68750			0.6
576	1431.69375					0.6
577	1431.70625					0.6
		689	1431.71250			0.6
578	1431.71875					0.6
				745	1431.72500	0.6
579	1431.73125					0.6
		690	1431.73750			0.6
580	1431.74375					0.6
581	1431.75625					0.6
		691	1431.76250			0.6
582	1431.76875					0.6
				746	1431.77500	0.6
583	1431.78125					0.6
		692	1431.78750			0.6
584	1431.79375					0.6
585	1431.80625					0.6
		693	1431.81250			0.6
586	1431.81875					0.6
				747	1431.82500	0.6
587	1431.83125					0.6
		694	1431.83750			0.6
588	1431.84375					0.6

589	1431.85625					0.6
		695	1431.86250			0.6
590	1431.86875					0.6
				748	1431.87500	0.6
591	1431.88125					0.6
		696	1431.88750			0.6
592	1431.89375					0.6
593	1431.90625					0.6
		697	1431.91250			0.6
594	1431.91875					0.6
				749	1431.92500	0.6
595	1431.93125					0.6
		698	1431.93750			0.6
596	1431.94375					0.6
597	1431.95625					0.6
		699	1431.96250			0.6
598	1431.96875					0.6
				750	1431.97500	0.6
599	1431.98125					0.6
		700	1431.98750			0.6
600	1431.99375					0.6